

IME01-001

on said printed circuit board, a first array of one or more blocks, said blocks having high thermal conductivity;

on said array of blocks, a chip formed of material that has low thermal conductivity;

A<sup>2</sup>  
CO<sub>2</sub>  
a plurality of reaction chambers in said chip, whereby at least one reaction chamber symmetrically overlies a single block of the first array and thermal conductance between each reaction chamber and the block that it overlies is much greater than thermal conductance between any two reaction chambers;

a heating source and a temperature sensor between the chip and each high thermal conductivity block;

between each of said blocks and said chip, a layer that is softer than 100 and harder than 1, when measured on a Shore D Durometer; and

electrical leads from each heat source and each temperature sensor whereby each heating source can be independently controlled.

2. The apparatus described in claim 1 wherein said chemical reactions are selected from the group consisting of temperature dependent chemical reactions and polymerase chain reactions.

A<sup>3</sup>  
4. The apparatus described in claim 1 wherein said high thermal conductivity blocks have a thermal conductivity that is between about 2 and 500 W/m.K.

A<sup>4</sup>  
SUB  
B1  
19. A process for simultaneously performing multiple, independently controlled,